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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/073,405	02/13/2002	Mario Meggiolan	Q68479	3986

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VOLPE AND KOENIG, P.C.
UNITED PLAZA, SUITE 1600
30 SOUTH 17TH STREET
PHILADELPHIA, PA 19103

EXAMINER

FISCHER, JUSTIN R

ART UNIT	PAPER NUMBER
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1733

DATE MAILED: 10/25/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/073,405

Applicant(s)

MEGGIOLAN, MARIO

Examiner

Justin R Fischer

Art Unit

1733

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-52 is/are pending in the application.
- 4a) Of the above claim(s) 20-23, 40-45, 47 and 49 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☐ Claim(s) ____ is/are rejected.
- 7) ☒ Claim(s) 1-19, 24-39, 46, 48 and 50-52 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. ____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date ____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of a method incorporating an expandable core formed of synthetic material is acknowledged. The traversal is on the ground(s) that material choice is common and should not subject the claims to restriction.

Furthermore, the claims do not place a serious burden of the Patent Office. This is not found to be persuasive because, as previously set forth, the respective materials are mutually exclusive and the use of one particular material can be the distinguishing factor in determining patentability (i.e. they are patentably distinct). It is emphasized that applicant has not submitted sufficient evidence that shows the species to be obvious variants nor has applicant admitted the same in the record. Lastly, it is noted that rejoinder will be considered upon the indication of allowable subject matter, depending on the basis thereof.

The requirement is still deemed proper and is therefore made FINAL.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 5-7, 46, 51, and 52 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. As set forth in the previous action, the claims define a thermal dilation coefficient (appears to be analogous to thermal coefficient of expansion). This property is recognized as being the ratio between the

fractional change in length of a given material and the change in temperature as set forth below:

$$\frac{\Delta L}{L * ^\circ C} = \frac{mm}{mm * ^\circ C} = \frac{1}{^\circ C}$$

Thus, the proper dimensions for this property of $^\circ C^{-1}$. Anderson (newly cited below) uses these dimensions when describing the thermal coefficient of expansion. It is suggested that applicant amend the claims to include the dimensions noted above.

As to claims 51 and 52, the claims suggest that the end flanges of the mold apply pressure to the core and that such pressure is applied by helical springs. However, as set forth in Page 9 of the original disclosure and depicted in Figure 18, it appears that the helical springs apply an axial force directly to the ends of the bladder to minimize axial expansion of said bladder. It is the examiner's understanding that the end flanges of the mold are simply the end regions of the respective mold components. In this instance, the casing 20, which houses the helical springs, is attached to the mold assembly using screws, such that the helical springs are arranged adjacent the end flanges of the core or bladder. Applicant is asked to clarify the language of the claimed invention without the introduction of new matter.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1-14, 16-19, 24-39, 46, 48, and 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Arredondo (US 5,246,275, of record) and further in view of Anderson (US 2,794,481, newly cited). Arredondo is directed to a lightweight bicycle tire construction formed by the following method: (a) providing an inflatable (expandable) mandrel having a rim portion, a spoke portion, and a hub portion, (b) wrapping a number of fabric layers having a plastic material matrix around each of the portions noted above to form a layered tubular body, (c) placing the thus covered mandrel in a mold, (d) increasing the temperature of the mold to cure the plastic material while the mandrel is inflated/expanded (this step applies pressure to the layers and compresses them against the mold surface), and (e) removing the layered tubular body from the mold and the mandrel (Column 5, Lines 10-30). In this instance, the method of Arredondo uses an inflatable bladder to apply tension to the fabric layers (e.g. bladder is inflated and fabric layers are pressed against mold). Alternatively, however, it is well recognized in the composite industry that a solid, expandable core or bladder can be used to provide the desired expansion, as shown for example by Anderson (Column 1, Lines 50-65 and Column 2, Lines 10-13), such that the expandable core expands due to the application of heat (as opposed to expandable bladder that expands due to inflation). In particular, Anderson suggests that the use of a solid, expandable core/bladder eliminates the problems commonly associated with inflatable cores/bladders and thus provides one of ordinary skill in the art at the time of the invention with ample motivation to modify the method of Arredondo. Lastly, while

Anderson does not expressly suggest the manufacture of composite wheel hubs, a fair reading of Anderson suggests that the use of a solid, expandable core, in place of an inflatable core, is more broadly directed to the manufacture of composite articles in which a plurality of fabric layers are arranged on an expandable (solid or inflatable) core or bladder.

It is initially noted that applicant has not challenged the examiner's previous position that inflatable mandrels and solid, expandable mandrels are recognized alternatives in the manufacture of composite articles (see Non-Final Rejection- Page 11).

Regarding claim 2, as noted above, the plastic material is cured at an elevated temperature while the layers are compressed against the mold surface (temperature and pressure are simultaneously applied).

As to claim 3, the fabric layers are compressed against the mold surface (radial direction).

With respect to claim 4, Arredondo includes a cooling step after the plastic material is cured (Column 6, Lines 50-51).

As to claims 5, 6, and 46, Arredondo is directed to a method of making a bicycle wheel having a hub, wherein multiple layers of fiber fabric are arranged on an inflatable mandrel. In describing the mandrel, Arredondo suggests that it is formed of a "high temperature resistant elastic material" (Column 12, lines 32-38) since the curing step occurs at a high temperature. The exemplary example of Arredondo has a curing temperature of about 180 degrees Celsius (Column 12, Lines 61-65), which suggests

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that the mandrel has a heat resistance of at least 80 degrees Celsius. As to the dilation coefficient, one of ordinary skill in the art at the time of the invention would have recognized the language "highly elastic material" of Arredondo as suggesting materials having a dilation coefficient in accordance to the limitations of the claimed invention. It is noted that Anderson describes a wide variety of solid, expandable cores in which the thermal coefficient of expansion is always greater than $5 \times 10^{-5} \text{ }^{\circ}\text{C}$ (Column 2, Lines 69-71). Thus, the use of a material having a dilation coefficient greater than 5×10^{-5} , more preferably greater than 9×10^{-5} , would have been obvious to one of ordinary skill in the art at the time of the invention since these values define highly expandable/elastic materials and such materials are desired in the method of Arredondo, there being no conclusive showing of unexpected results to establish a criticality for a material having the claimed dilation coefficient. Furthermore, the claimed values for the thermal expansion coefficient appear to be consistent with those commonly used in the manufacture of composite articles.

Regarding claims 7 and 8, Anderson evidences the well-known use of PTFE for the manufacture of expandable cores or bladders (Column 8, Lines 15-25).

As to claim 9, Arredondo suggests the use of a wide variety of fibers, including aramid fibers, carbon fibers, and glass fibers (Column 2, Lines 59-62).

Regarding claim 10, Arredondo describes the use of a wide variety of thermosets (Column 4, Lines 21-34).

With respect to claims 11-13, Arredondo describes an embodiment in which the composite is cured at a temperature of 177 degrees Celsius for about two hours.

Furthermore, the reference suggests that the curing temperature and time varies as a function of the type of plastic material used (Column 12, Lines 60-65).

Regarding claims 14 and 16-19, Arredondo teaches a bicycle wheel construction having a rim portion, spoke portion, and hub portion. As depicted in Figures 1 and 3, the hub portion does not appear to be bell-shaped (cylindrical center section and two wider diameter ends). However, one of ordinary skill in the art at the time of the invention would have found it obvious to form the hub portion with such a shape because a majority of hubs are formed with wider diameter ends- while not depicted as such by Arredondo, this shape represents the most common hub construction in a large number of wheels, including bicycle wheels. It is noted that Arredondo states that the mold has a contoured surface that is shaped so as to impart the desired shape onto the tubular body, such that if a bell-shaped hub were desired, one of ordinary skill in the art at the time of the invention would have been able to form the mold with such a design. This design is seen to constitute a hub in which there is a progressive increase in thickness from the center to the ends. Alternatively, the hub could be constructed with a less progressive or steeper increase in thickness as is required by claim 18, wherein each of the claimed designs would have been within the purview of one of ordinary skill in the art at the time of the invention depending on the desired aesthetic characteristics and desired function of the hub. Lastly, applicant has not provided any conclusive showing of unexpected results to establish a criticality for the claimed hub design.

With respect to claims 24-39 and 48, in the method of Arredondo, a plurality of fiber reinforced plies or layers are wrapped on a mandrel. Arredondo states that the

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layers can be unidirectional or they can be woven and further that the use of plies having a variety of orientations is preferred as set forth in Table 1. Arredondo also states that the layers can be cut to any desired shape (Column 13, Lines 60+). One of ordinary skill in the art at the time of the invention would have found it obvious to include layers in only some regions (layers are not continuous over entire extent of mandrel) in order to obtain a desired thickness. For example, if a larger thickness were desired in an end region as compared to a central region, additional layers would only be applied at the end regions. In particular, one of ordinary skill in the art at the time of the invention would have been able to apply the desired number of layers in certain regions to obtain the desired orientation and thickness. It is noted that the language of claim 24 is being viewed as requiring at least one layer that is only arranged over the core end portion and at least one layer that extends over the entire core axis.

Regarding claims 25-30, as noted above, Arredondo suggests that the respective layers can be cut in any shape.

As to claim 31, Table 1 of Arredondo describes the use of alternating plies.

Regarding claim 32-39, as noted above, one of ordinary skill in the art at the time of the invention would have been able to appropriately select the desired shape of each ply and the desired location of each ply. Table 1 shows the use of woven layers and unidirectional layers and further shows the use of alternating ply orientations.

As to claim 50, the claim is directed to the structure of the mold and fails to further define the method of the claimed invention. In this instance, each end of the mold in the hub portion can be viewed as an end flange.

6. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Arredondo and Anderson as applied in claim 1 above and further in view of Barrier (US 5,192,384, of record). The method of Arredondo, in view of Anderson, includes the step of placing fabric layers on an expandable mandrel. In this instance, the mandrel would be expected to be a single piece mandrel. One of ordinary skill in the art at the time of the invention would have found it obvious to use a two-piece mandrel in the method of Arredondo since multi piece mandrels are commonly used in a wide variety of industries. For example, Barrier is similarly directed to the arrangement of fabric layers over a mandrel, wherein said mandrel can be solid and further can be formed of multiple pieces (Column 5, Lines 20-35). Thus, single and multi-piece mandrels are recognized as equivalent alternatives and one of ordinary skill in the art at the time of the invention would have readily appreciated either in the method of Arredondo absent any conclusive showing of unexpected results.

Response to Arguments

7. Applicant's arguments with respect to claims 1-49 have been considered but are moot in view of the new ground(s) of rejection. Applicant's primary argument pertains to the use of inflatable bladder in the method of Arredondo in which the inflation of the bladder causes expansion, as opposed to the claimed invention in which a solid, expandable core/bladder is used and expansion occurs as a result of an increase in temperature. It is agreed that Arredondo is silent as to the use of a solid, expandable core/bladder. However, as set forth in the previous rejection and maintained in the rejection above, each of the above noted cores/bladders is extremely well known in a

variety of industries, including the composite industry. In fact, Anderson specifically suggests that solid, expandable mandrels are less cumbersome and provide easier operation as compared to inflatable mandrels- it is emphasized that Anderson is similarly directed to making a tubular, composite article (Column 1, Lines 50-60). It is additionally noted that Barrier suggests the use of a mandrel that can be solid, hollow, or otherwise built up, and in some cases may be collapsible (Column 5, Lines 20-25). Thus, the prior art as a whole suggests that one of ordinary skill in the art at the time of the invention would have readily appreciated the use of a solid, expandable mandrel in the method of Arredondo. In this instance, as detailed by Anderson, heat is used to expand the mandrel and force the composite layers outward- this is analogous to the expansion step of the claimed invention in which the expansion occurs due to an increase in temperature.

Regarding claims 24-39 and 48, applicant contends that Arredondo fails to describe the claimed shapes. However, as set forth above, Arredondo specifically states that the layers can be cut to any desired shape (Column 13, Lines 60+). Absent any conclusive showing of unexpected results, one of ordinary skill in the art at the time of the invention would have found it obvious to form the layers with a wide variety of shapes. Furthermore, while applicant states that Table 1 teaches fiber orientation on a wheel (not a hub), the hub portion is a component of the wheel and the description set forth in Table 1 is directed to all of the wheel components. In one example, the reference states, "the lightweight, high strength material of the inner rim, spokes, and hub comprises a first layer of woven aromatic polyamide fibers, followed by a first layer

of unidirectional carbon fibers, followed by a second layer of woven aromatic polyamide fibers, followed by a layer of glass fibers" (Column 3, Lines 30-45).

Conclusion

8. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **Justin R Fischer** whose telephone number is **(571) 272-1215**. The examiner can normally be reached on M-F (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Blaine Copenheaver can be reached on (571) 272-1156. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Justin Fischer

October 22, 2004


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